# Hydrogeologic Investigation

## Rodger's Drilling Site
## 2615 ISLETA BLVD., SW

**ALBUQUERQUE,
BERNALILLO
COUNTY, NM**

**April 17, 2001**


**Prepared For:**

**Bernalillo County Environmental
Health Department
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April 17, 2001

Mr. Nolan Bennett
Environmental Health Scientist
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Sent via e-mail: nbennett@bernco.gov and US Mail

RE: Transmittal of Hydrogeologic Investigation Report
2615 Isleta Blvd. SW, The Rodgers Drilling Site; NMED/USTB Facility ID No. 30287
Contract Control No. 980473

Dear Nolan:

Please find included herewith one copy of the Hydrogeologic Investigation Report for the Rodgers Drilling site. Recommendations for further action include conducting a short-term AS/VE Pilot Test, the preparation of a Tier 2 evaluation to determine if any additional remedial efforts are necessary at the site, and continued quarterly ground water monitoring.

Please do not hesitate to contact the undersigned if you have any questions or comments regarding this matter.

Respectfully submitted,
FAITH ENGINEERING, INC.

Stuart E. Faith, PE, CS #80
President

cc. w/ encls. Mr. Tom Leck – NMED/USTB
Mr. Bill Brown - TPA

# HYDROGEOLOGIC INVESTIGATION REPORT

# RODGERS DRILLING SITE

**2615 ISLETA BLVD. ,SW**
**ALBUQUERQUE, NEW MEXICO**

**FAITH ENGINEERING, INC.**
**&**
**TECUMSEH PROFESSIONAL ASSOCIATES, INC.**

**APRIL 17, 2001**

Submitted to:

Mr. Nolan Bennett
Environmental Health Scientist
Bernalillo County Environmental
Health Department

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# *1.0 EXECUTIVE SUMMARY*

On behalf of the Bernalillo County Environmental Heath Department (BCEHD), Faith Engineering, Inc. (FEI) and Tecumseh Professional Associates, Inc. (TPA) performed a Hydrogeologic Investigation (HI) at the Rodgers Drilling Site (the Site) located at 2615 Isleta Blvd., SW in Albuquerque, New Mexico (Figure 1). The HI was performed to evaluate hydrocarbon releases discovered during removal of former underground storage tanks (USTs) at the facility in 1988 (Figure 2). The Site is located approximately one-half mile north of the intersection of Highway 500 (Rio Bravo Blvd.) and Highway 314 (Isleta Blvd.). Land use in the immediate area is a mixture of light commercial and residential (Figure 2).

The Site was first investigated by Metric Corporation (Metric) in 1989 and 1990 under contract with Rodgers Drilling, Inc. Nineteen drive point and 2 hollow stem auger monitor wells were installed in the Site vicinity which identified a large dissolved-phase benzene, toluene, ethyl benzene, and total xylenes (BTEX) groundwater plume. In 1991, Metric installed a passive air-inlet soil remediation system at the Site consisting of five trenches filled with gravel and slotted 4" diameter PVC manifolded to above-ground wind-turbines (Figure 3).

In 1992, the New Mexico Environment Department (NMED) included the Rodgers Site on its list of GWPA State Lead remediation projects. NMED retained Billings and Associates, Inc. (BAI) to further evaluate site conditions and design and implement an enhanced remedial strategy. As part of an abbreviated investigation, BAI advanced and sampled a series of 12 soil borings along the northern and southern margins of the Rodgers property. BAI subsequently installed an in-situ SVVS$^{TM}$ remediation system that reportedly consisted of two primary lines of 27 sparge and vent wells, which are shown, in Figure 3. The BAI system was reportedly operated for a period of approximately 3 years during which an unknown amount of hydrocarbons was removed. Reductions in groundwater BTEX levels were documented in wells during this period.

The adjacent Sparkle Car Wash property is also a leaking UST site. Remedial efforts at the Sparkle site have included excavation and disposal of contaminated soils from the former UST hold and installation and operation of an active sparging/passive soil ventilation system in 1991.

The objective of FEI/TPA's HI was to better characterize the current subsurface hydrogeologic regime and the vertical and horizontal extent of soil and groundwater impacts at the Site following remedial efforts. The HI included four primary tasks: 1) review of NMED files, site mapping and photography, and review of historic soil and groundwater data; 2) re-sampling and analysis of groundwater from previously installed monitor wells; 3) advancement and sampling

of new soil borings, monitor, and pilot wells; and 4) completion of this summary HI Report.

Initial FEI/TPA groundwater sampling for the 1st Quarter of monitoring took place on September 25 and 26, 2000. TPA drilling activities took place at the Site between November 2, 2000 and January 3, 2001. A total of 31 boreholes were advanced in the Site vicinity. Four were completed as 2-inch diameter monitor wells, 7 as 4-inch diameter monitor/vacuum extraction (VE) wells; 4 as multiple completion pilot test wells; one as a 2-inch diameter deep monitor/air injection well; and one as a groundwater flow sensor. The remaining 14 boreholes were plugged and abandoned with bentonite pellets and bentonite cement grout to the land surface. Groundwater sampling of the newly installed wells took place on January 16, 2001.

Retrieved samples collected from boreholes indicate sediments between the ground surface and approximately 20 feet below surface grade (bsg) can be subdivided into 4 primary laterally extensive Lithologic Units (Figures 4 and 5). Lithologic Unit I extends from the ground surface to approximately 2-3 feet bsg and is comprised primarily of gravelly clays and clayey and silty gravels. This unit appears to be fill material. ***Numerous underground piping and conduits were encountered in this interval during the drilling process across the entire Rodgers Site.*** Lithologic Unit II extends from the base of Lithologic Unit I to approximately 4 to 8 feet bsg and is composed of fine to medium-grained silty sands with minor thin lenses of sandy or silty clays. Horizontal facies changes in the lower half of this unit were often observed. Lithologic Unit III extends from the base of Lithologic Unit II to approximately 8 to 10 feet bsg and is composed primarily of well-sorted fine to medium grained sands. Lithologic Unit IV extends to below 20 feet deep and is composed primarily of medium to coarse grained sands with lesser amounts of fine to coarse gravel. A thin 1-to 2-foot thick subunit of discontinuous well-sorted fine-medium grained sands was observed at a depth of 10 to 13 feet in many of the boreholes advanced at the Site. The overall trend in Lithology at the Site is a gradual coarsening downwards.

During the Investigation, groundwater saturated conditions were encountered at a depth of approximately 8 feet bsg. Evaluation of groundwater level measurements indicated the potentiometric surface sloped to the west-southwest at a gradient of approximately 0.0006 feet/foot on September 26, 2000 (Figure 6).

Gasoline and diesel hydrocarbon impacts to soils in the immediate vicinity of the Site were found in an area extending primarily south and west of the former USTs (Figures 7 and 8). Total petroleum hydrocarbon $(TPH)_{gasoline\ range}$ levels in retrieved soil samples were measured at concentrations of up to 11,000 parts per million (ppm) and total ionizable volatile compounds (TIVC) or total volatile organic compounds (TVOC) headspace concentrations exceeded 10,000 parts per million/volume (ppm/v). $TPH_{gasoline\ range}$ levels exceeding 100 ppm extend across an

area approximately 200 feet by 125 feet across. $TPH_{diesel\ range}$ concentrations were identified at levels up to 2,600 ppm in retrieved soil samples and appeared limited to an area about 60% the size of the gasoline TPH plume. $TPH_{diesel\ range}$ levels exceeding 100 ppm extend across an area approximately 130 feet by 80 feet in size. Based on analysis of laboratory chromatograms, hydrocarbons in soils at the Site are weathered in nature, possibly as a result of prior remedial efforts. Hydrocarbon saturated or "highly contaminated" soils were identified along the water table across the majority of the eastern Rodgers yard (Figures 4 and 5; see Borehole Logs, Appendix A)

Groundwater impacts at the Site are characterized by high levels of dissolved-phase BTEX which extend offsite onto the Sparkle Car Wash and Auto Zone properties (Figures 9 and 10). Groundwater sample data from monitor wells indicated very high levels of BTEX compounds in the southern half of the Rodgers yard extending beneath the Rodgers storage buildings. Benzene concentrations were measured at levels up to 8,700 ppb. Examination of groundwater sample data indicates benzene appears to have been removed from the northern half of the groundwater plume by natural biodegradation and dispersion processes and the in-situ SVVS/Metric system. Unfortunately, levels of toluene, ethyl benzene and total xylenes concentrations are still very high in the northern portion of the plume (Figure 10).

Inorganic groundwater quality samples collected from monitor wells indicate moderate to high levels of bicarbonate and sulfate as the primary inorganic groundwater constituents at the Site. Phosphate and nitrate concentrations were identified at low levels or below method detection limits. Total iron concentrations on unfiltered samples ranged from a low of 2.19 ppm to 14.3 ppm.

An estimated 4,000 cubic yards of hydrocarbon contaminated soil is present at the Rodgers Site with approximately 8,000 cubic yards of non-impacted overburden. Residual TPH spill mass estimates suggest that approximately 13,000 pounds (lbs) of $TPH_{gasoline}$ is still present in the immediate Rodgers Site vicinity. Residual TPH spill mass estimates suggest that approximately 2,000 lbs of $TPH_{diesel}$ is also present. Total residual TPH at the Site is approximately 15,000 lbs. (2,500 gals.).

The vertical and horizontal extent of soil and groundwater hydrocarbons exceeding WQCC and USTR standards has been defined. Based on existing data, FEI/TPA recommend implementation of a short-term air sparging/vacuum extraction (AS/VE) pilot test and completion of a Tier Two RBDM evaluation at the Site. We also recommend continued quarterly groundwater monitoring to document plume migration patterns.

# *2.0 INTRODUCTION*

## 2.1 BACKGROUND/SITE HISTORY

### 2.1.1 Overview

The Rodgers Drilling Site is located at 2615 Isleta Blvd., SW (the west side of US Highway 314) in Albuquerque, New Mexico, and is highlighted in the site basemap shown in Figure 2. Surrounding properties include an Auto Zone parts store to the south, former Sparkle Car Wash to the north, private residences to the west, and Isleta Blvd to the east. It appears that two source areas are present in the site vicinity; one located in the vicinity of the former USTs on the Rodgers property, and one located in the vicinity of the former Sparkle Car Wash USTs.

### 2.1.2 Rodgers Site

According to available records, the Site was the location of several USTs owned and operated by Rodgers Drilling, Inc. between 1963 and 1988 (Metric 1990). Hydrocarbon releases were first identified in the Site vicinity in 1983, and in the immediate vicinity of the Rodgers USTs during removal of the former USTs and associated piping in 1988.

Initial investigation activities were conducted by Metric in 1989 and 1990 under contract with Rodgers Drilling Inc. Nineteen drive points and 2 hollow stem auger monitor wells were installed in the site vicinity identifying a large dissolved-phase benzene, toluene, ethylbenzene, and xylenes (BTEX) groundwater plume. In 1991, Metric installed a passive air-inlet soil remediation system at the Site. Five trenches approximately 50 feet in length were excavated to the water table allowing for four-inch diameter PVC slotted screens to be placed horizontally and manifolded to above ground wind turbines. The trenches were back filled with gravel and capped with asphalt (Figure 3). Additionally, 150 cubic yards of soils were reportedly removed from the former UST location.

The Rodgers Site was added to the NMED list of GWPA State Lead remediation projects in 1992. NMED retained Billings and Associates, Inc. (BAI) to evaluate site conditions and design and implement an enhanced remedial strategy. BAI's investigation consisted of advancing 12 soil borings along the northern and southern margins of the Rodgers property. No soil boring logs could be located in the NMED case files. Limited PID and TPH analyses were conducted on retrieved soil samples.

Subsequently, BAI installed an in-situ SVVS$^{TM}$ remediation system consisting of 2 primary lines of sparge and vent wells (Figure 3). A line of 20 sparge/vent wells are indicated from the BAI site plan as being located along the south side of the Rodgers building. The exact location is unclear and may be located on either side of the Auto Zone/Rodgers property boundary and can only be estimated as all components of this line are buried. An additional 7 sparge/vent wells are located along the north side of the Rodgers property and could be located from evidence in the field.

The AS/VE system was operated for approximately 3 years prior to shutdown. Laboratory TPH and/or BTEX off-gas samples were not reported through out this period in BAI quarterly reports. However, samples were analyzed in the field using a PID. Maximum PID readings on vapors recovered from the southern leg of the system reportedly did not exceed 10 ppm/v. The northern leg was located closer to the source area and yielded off-gas PID concentrations of greater than 700 ppm/v during initial system operation. Overall maximum combined stack emissions were initially reported as high as 1700 ppm/v. The discrepancies in reported high values for the total emissions vs. northern/southern individual emissions is likely due to "lamp fogging" of the BAI PID during sample collection. Concentrations in the northern leg exceeded the ability of the PID to analyze the sample. Total hydrocarbons removed from the Site by the BAI system are unknown.

BAI documented reductions in BTEX concentrations in on-site monitor wells. However, re-sampling of select groundwater monitoring wells in 1998 following the shutdown of the reclamation system identified increased BTEX concentrations in several wells.

### 2.1.3 Sparkle Site

In 1990, approximately 250 yards of hydrocarbon contaminated soil was excavated from the Sparkle tank pit and allowed to aerate on-site. At this time, Mr. Ludwig Hoffinger, owner of the Sparkle property, and his consultant, Monteverde, Inc., installed an active horizontal groundwater sparging/passive vadose zone venting system in the excavation pit (Figure 3). This system was operated for approximately 3 months before being turned off. Long-term monitoring by the responsible party indicates that the Sparkle plume is relatively restricted in size, is partially remediated, and has not co-mingled with the Rodgers plume.

## 2.2 SCOPE OF WORK

FEI/TPA's initial scope of work for the project consisted of four primary tasks:

- Review NMED/USTB files, site mapping, photography, and review of historic groundwater and soil data.
- Assess current Site conditions, sample existing monitor wells and conduct three additional quarters of sampling.
- Advance and sample soil borings, monitor, and pilot test wells in the Site vicinity to identify the magnitude and extent of soil and groundwater hydrocarbon impacts, better evaluate site hydrogeology, and allow for later AS/VE pilot testing.
- Analyze collected data and prepare and submit a Hydrogeologic Investigation (HI) Report pursuant to the USTR Part XII, Section 1212.

# *3.0 PHYSICAL SETTING*

## 3.1 PHYSIOGRAPHY

The Rodgers Site is approximately 2 acres in size, and is located at an average elevation of approximately 4,928 feet above mean sea level. Regional topography slopes southeast toward the Rio Grande, which is located approximately 2000 feet to the east of the Site (Figure 1). Locally, runoff from the Site drains to the south. A large infiltration basin is located immediately south of the Site on Auto Zone property (Figure 2).

## 3.2 GEOLOGIC SETTING

### 3.2.1 Regional Geology

The Site rests on Quaternary fluvial sediments deposited by the nearby Rio Grande. Underlying the Site are poorly to moderately consolidated sedimentary rocks of the Tertiary Santa Fe Group (Kelly, 1977). During this investigation, only the uppermost Quaternary fluvial unit was encountered.

### 3.2.2 Site Geology

During the Investigation, a total of 31 boreholes were advanced in the Rodgers and former Sparkle Car Wash Site vicinity to depths of between 7.5-19.5 feet bsg at the locations shown in Figure 2. Site geology as observed in retrieved split-spoon samples and soil cuttings can be subdivided into four primary lithologic units based on grain size and areal extent. Although facies changes were observed during drilling activities, each of these primary stratigraphic units was found to be laterally persistent across the Site. To better illustrate site geology, TPA constructed the simplified geologic cross section shown in Figure 4 for the locations A-A', and B-B'. Borehole lithologic logs are presented in Appendix A.

Overall, the lithology at the Site is characterized by generally coarsening grain size with depth. Sediments were generally unconsolidated in nature with little or no carbonate cementation. Lithologic Unit I extends from the ground surface to approximately 2-3 feet bsg and is comprised primarily of gravelly clays and clayey and silty gravels. This appears to be fill material. Numerous buried utilities, piping, and other debris encountered during intrusive activities would support this observation. Lithologic Unit II extends from the base of Lithologic I to approximately 4 to 8 feet bsg and is composed of fine to medium grain-grained silty sands with minor thin lenses of silty or sandy clays. Horizontal facies changes were observed in the lower half of this unit. Lithologic Unit III extends from the base of Lithologic Unit II to approximately 8 to 10 feet

bsg and is composed primarily of well-sorted fine to medium grained sands. Lithologic Unit IV extends to greater than 20 feet deep and is comprised of medium to coarse sands with lesser amounts of fine to coarse gravel with some cobbles. In general, the coarsest sediments were found at or slightly below the water table in a one to 2 foot thick interval. Below this coarse zone at a depth of between 10 to 13 feet, a thin 1-to 2-foot thick subunit of discontinuous well-sorted fine-medium grained sands was observed in many boreholes advanced at the Site.

## 3.3 HYDROGEOLOGIC SETTING

Groundwater was encountered in the Site vicinity at a depth of approximately 8 feet. Groundwater is typically encountered slightly below or at the contact between Lithologic Units II and III (Figure 4) and is unconfined in nature. Based on groundwater sampling efforts at the Site and grain size, the shallow aquifer is of high yield. Newly installed FEI/TPA wells recharged quickly during sampling. The new wells were screened across the water table using standard well construction techniques and high-flow well screen.

Groundwater level measurements in Site vicinity monitor wells are summarized in Table 1. Analysis of groundwater level data collected on September 26, 2000 and January 16, 2001 suggest the groundwater potentiometric surface slopes to the west-southwest at a gradient of approximately 0.0006 feet/foot (Figure 6). This calculated flow direction is almost a $90^0$ shift from former south-southeast estimates in groundwater flow by Metric (1990) and BAI (1993-1995). A similar change in flow direction over time was also measured at the nearby Climate Roofing Site (FEI/TPA, 2001).

# *4.0 FIELD AND LABORATORY SAMPLING METHODS AND PROCEDURES*

## 4.1 GENERAL

This section describes the methods and procedures for the following project activities:

- Soil Boring, Monitor Well, and Pilot Test Well Installation
- Subsurface Soil Sampling and Analysis
- Groundwater Sampling and Analysis

As per the requirements of CFR 1910.120, FEI/TPA prepared a site specific Health and Safety Plan prior to initiation of field activities at the Site. A copy of the Health and Safety Plan is presented in Appendix C.

## 4.2 SOIL BORING AND MONITOR WELL INSTALLATION

Thirty-one boreholes were advanced in the Site vicinity between November 2, 2000 and January 3, 2001 using a CME-75 hollow-stem auger (HSA) drill rig supplied and operated by Rodgers Drilling, Inc. Following advancement, all soil borings not completed as monitor wells were abandoned by backfilling with approximately 3-5 feet of activated bentonite pellets, bentonite-cement grout and approximately 1 foot of native fill or concrete at the land surface. Borehole lithologic logs and monitor well completion diagrams are located in Appendix A.

Four of the 31 boreholes were completed as 2-inch diameter PVC monitor wells. Each well was completed with 10 feet of schedule 40, 0.01 slot standard high flow PVC well screen. A 10-20 silica sandpack was emplaced from the base of the borehole to approximately one to two feet above the top of the well screen followed by approximately 2-4 feet of bentonite pellets. All bentonite was hydrated in approximately one-foot lifts by adding water to form a seal. A bentonite-cement grout was emplaced from the top of the seal to just below the land surface followed by a standard 8-inch manway and concrete apron. A compression plug with lock was inserted in the top of each PVC well casing.

Seven of the 31 boreholes were completed as 4-inch diameter PVC vacuum extraction/monitor wells. Each well was completed with schedule 40, 0.01 slot high-flow wire-wrapped screen with lengths ranging between 5.5 and 7 feet depending on Site specific lithologic conditions. An 8-12 foot silica sandpack was emplaced from the base of the bore hole to approximately one foot above the top of the well screen followed by approximately 2 feet of bentonite pellets hydrated

to form a seal. A bentonite-cement grout was emplaced from the top of the seal to just below the land surface followed by a standard 12-inch manway and concrete apron. A 4-inch PVC slip cap was installed over the top of each PVC well casing to complete the installation.

Four of the 31 boreholes were completed as 1-inch diameter PVC multiple completion pilot test wells. Each multiple completion consists of 2, (one deep and one shallow) 3-foot long, 1-inch diameter, schedule 80, standard 0.01 slot screen and associated PVC blank. A 10-20 silica sandpack was emplaced at the base of the borehole to approximately 6-inches above the deep well screen followed by approximately 1.5 feet of bentonite pellets hydrated to create an intermediate seal. A second silica sandpack was emplaced at the top of the intermediate bentonite seal to approximately 6-inches above the shallow well screen followed by approximately 6 to 12-inches of hydrated bentonite pellets creating a second seal. A bentonite-cement grout was emplaced from the top of the second seal to just below the land surface followed by a standard 12-inch manway and concrete apron. A 1-inch PVC slip cap was installed over the top of each well casing completing the installation.

One of the 31 boreholes was completed as a 2-inch PVC AS/deep completion well. The AS well consist of a 5-foot long, 2-inch diameter, schedule 40, 0.01 high-flow screen. Natural formation sands were allowed to fill in to approximately 2 feet above the well screen. A bentonite cement slurry was then pressure grouted to just below land surface where a 12-inch manway was set in a concrete apron. A 2-inch compression plug with lock was inserted in the well casing completing the installation.

Remaining boreholes not completed as monitor wells were abandoned with bentonite pellets to approximately 1-foot below land surface where either native fill or concrete to the land surface completed the abandonment.

Sediment samples were collected from each borehole on a continuous basis using three-inch diameter, 5-foot long split-spoon core barrels or 2-foot long drive split spoons. Samplers were decontaminated between sample runs using an alconox solution followed by a tap water wash. All soil samples were described by a TPA Geologist or Engineer using the Unified Soil Classification System (USCS) logging methodology. Drill cuttings and rig activity were also observed to identify lithologic contacts. Drill cuttings have been temporarily stored on-site on visquene plastic awaiting proper disposal.

## 4.3 SOIL SAMPLING AND ANALYSIS

During drilling activities, retrieved sediment samples were collected from boreholes for field headspace analysis using a FID and/or PID. Total volatile organic compounds (TVOC) were

measured using a Sensidyne Flame Ionization Detector (FID). 250 parts per million/volume (ppm/v) methane span gas and ambient air were used to calibrate the FID prior to use. Total ionizable volatile compounds (TIVC) were measured using a RAE-2000 Model PID utilizing a 10.6 eV lamp. 100 parts per million/volume (ppm/v) isobutylene span gas and ambient air were used to calibrate the PID prior to use.

Results of the field headspace and laboratory analyses are presented in Table 2 and Figures 5 and 7, and on the borehole logs presented in Appendix A. At each drilling location, discrete sediment samples were also collected using the USTR Methanol Extraction Method. These samples were kept on ice and hand delivered to Hall Environmental Analysis Laboratory (HEAL) located in Albuquerque, New Mexico for laboratory analyses. Laboratory soil samples were analyzed for the following parameters:

- Total Petroleum Hydrocarbons ($C_5$-$C_{28}$ carbon range) (TPH $_{\text{gas-diesel range}}$) using EPA Method 8015 (modified) (GC-FID)
- Volatile Organic Compounds (VOCs) including BTEX, EDC, EDB, and MTBE using EPA Method 8260 (GC-MS)
- Polynuclear Aromatic (PNA) Compounds using EPA Method 8310 (SIMS) – [Select samples]
- Lead using EPA Method 6010/6020 (TCLP) – [Select samples]

During the Investigation, all soil samples were handled using strict Chain-of-Custody procedures. Laboratory reports including quality assurance/quality control data (QA/QC) and chain-of-custody documentation are presented in Appendix B.

## 4.4 GROUNDWATER SAMPLING AND ANALYSIS

Two separate groundwater sampling events were conducted in the Site Vicinity as part of the HI. On September 25 and 26, 2000 groundwater samples were collected for the 1st Quarterly Report from eighteen of the previously installed monitor wells for laboratory analysis. On January 16, 2001, following completion of HI drilling, groundwater samples were collected from the ten newly installed and one previously installed monitor wells. Groundwater laboratory analytical results are presented in Table 3 an Appendix B.

During each of the two sampling events, the water level in each well was measured and also gauged for the presence of LNAPL. Temperature, pH and conductivity measurements were taken during well purging to document well stabilization. In order to purge and develop the monitor wells, between three to five well volumes were removed prior to collection of groundwater samples using dedicated disposable bailers. Groundwater samples were collected and stored in appropriate containers using the appropriate preservatives. A blind duplicate was collected from one of the monitor wells for QA/QC purposes during the last sampling event.

Samples were collected using strict chain-of-custody procedures, stored on ice in a cooler, and hand-delivered to Pinnacle Laboratories, Inc. Purge water was discharged to an on-site paved surface to allow volatilization of any VOCs as per NMED guidance documentation.

Laboratory groundwater samples were analyzed for the following parameters:

- Volatile Organic Compounds (VOCs) including BTEX, EDC, EDB, tri-methyl benzenes (TMBs) and MTBE using EPA Method 8260 (GC-MS)
- Polynuclear Aromatic (PNA) Compounds using EPA Method 8310 (HPLC) - [Select samples]
- Electron receptors ($SO_4$, $NO_3$, Carbonates, and $Fe_2$) using EPA Methods 300, 310.1 and 6010B

# *5.0 RESULTS OF THE INVESTIGATION*

## 5.1 HYDROCARBON DISTRIBUTION IN SOIL

Table 2 presents a summary of laboratory analytical results for soil samples collected during subsurface drilling operations at the Site. In addition, the magnitude and extent of soil TIVC and TPH in cross-sectional view and soil TPH in plan view are presented in Figures 5, 7, and 8. These data indicate that two separate hydrocarbon soil plumes are present in the Site vicinity; one centered in the general vicinity of the former Rodgers Drilling Inc. USTs; and one centered in the vicinity of the former Sparkle Car Wash UST systems. As discussed earlier, this report focuses on the Rodgers soil and groundwater plume.

Based on drilling data, soil hydrocarbons from the Rodgers Site exceeding TPH and/or TIVC levels extend off-site to the north onto the Sparkle Car Wash property. The TIVC soil headspace plume is approximately 140 by 215 feet across. A slightly smaller adsorbed-phase TPH core of soil contamination is present and is approximately 120 by 200 feet in size. Soil hydrocarbons from the former Sparkle Car Wash USTs are estimated to be relatively circular measuring approximately 60 to 80 feet across. In general, both source area soil contaminants appear restricted to a thin zone at and below the current water table (Figure 5). Laboratory chromatographic analyses indicate the Rodgers Site soil hydrocarbons are consistent with both weathered gasoline and diesel fuel. The Sparkle Site soil hydrocarbons are consistent with weathered gasoline. The approximate extent of each type of residual hydrocarbon fuel in relation to the two source areas is presented on Figure 8. Maximum $TPH_{gasoline}$, $TPH_{diesel}$, total BTEX, and TMBs concentrations documented at the Site were 11,000 ppm, 2,600 ppm, 1211 ppm and 390 ppm, respectively.

Hydrocarbon saturated “highly contaminated” soils were identified in the Site vicinity in many of the borings advanced in the source areas at depths of between approximately 8 to 10 feet bsg. This coincides with the potentiometric surface and the basal portion of Lithologic Unit II and the upper 2 to 4 feet of lithologic Unit III. TIVC/TVOC levels exceeded 100 ppm/v in 18 of the 31 boreholes advanced in the Site vicinity. TIVC/TVOC levels in 17 of the soil boreholes exceeded 1,000 ppm/v (Figure 7).

Examination of soil laboratory data from borehole samples indicates extensive weathering of lighter end hydrocarbon compounds. With the exception of samples collected from boreholes B-2 (41 ppm) and B-9 (14 ppm ), benzene levels were below laboratory method detection limits. Moderate to high levels of toluene, ethyl benzene, total xylenes, TMBs and naphthalenes are still present.

## 5.2 HYDROCARBON DISTRIBUTION IN GROUNDWATER

Groundwater sampling data and chromatographic analysis suggest that remedial activities and natural biodegradation has had modest success at stripping off lighter end BTEX components. Benzene, toluene, ethylbenzene, total xylenes, and naphthalenes are presently above NMWQCC and NMED/USTB standards in select monitor wells. Table 3 and Figures 9 and 10 present a summary of detailed information on the distribution of hydrocarbon contaminants and groundwater quality.

High levels of dissolved-phase benzene, toluene, ethylbenzene, total xylenes, TMBs and naphthalene are present in select on and off site groundwater wells indicating that dissolved phase groundwater contamination extends off-site to the north in the Sparkle Car Wash property and to the south onto the Auto Zone property. Maximum benzene, toluene, and total xylenes groundwater concentrations were measured at 8700 ppb, 13,000 ppb and 8500 ppb respectively in VM-5. Maximum ethylbenzene and TMBs groundwater concentrations were measured at 2,300 ppb and 2020 ppb, respectively, in VM-4. Maximum naphthalene concentrations were measured at 520 ppb in FTW-2.

Accumulations of light-non-aqueous phase liquids (LNAPLs) were not observed in monitor wells installed in the Site vicinity during the September 2000 and January 2001 sampling events. Spotty hydrocarbon sheening was observed in many of the wells installed in the Rodgers yard.

Inorganic water quality analyses of groundwater samples collected from pre-existing and newly installed wells are presented in Table 3. Groundwater inorganic chemistry is dominated by moderate to high levels of bicarbonate ($HCO_3$) and sulfate ($SO_4$). Phosphate ($PO_4$), and nitrate ($NO_3$) concentrations in collected groundwater samples were identified at low levels or below analytical method detection limits. Total iron ($Fe^2/Fe^3$) concentrations ranged from a low of 2.19 ppm to a high of 14.3 ppm.

## 5.3 RESIDUAL SPILL MASS ESTIMATES

Preliminary estimates suggest that approximately 15,000 lbs. (approximately 2,500) gallons of gasoline and diesel are present as residual hydrocarbons in soils in the immediate vicinity of the Site. Based on laboratory analysis, only about 15 percent of total hydrocarbons encountered at the Site appear to be diesel fuel. Calculations are presented in Appendix D, which includes Figure A, Soil Residual TPH Spill Mass Estimation Map.

# *6.0 CONCLUSIONS*

Based on the data collected during the Hydrogeologic Investigation, the following conclusions are presented:

- Site geology as observed in retrieved soil samples can be subdivided into four primary laterally extensive lithologic units (Figure 4) which form an overall coarsening downwards sequence. Lithologic Unit I is silt and clay-rich. Lithologic Unit II is composed primarily of silty sand. Litholologic Unit III is primarily fine to medium sand, and Lithologic Unit IV is primarily medium to coarse sands with localized gravel zones.

- Two hydrocarbon source areas were identified during the HI; one centered in the vicinity of the former Rodgers USTs; a second smaller source is located in the vicinity of the former Sparkle USTs (Figures 7 and 8).

- During the Investigation, groundwater was first encountered at depths of between 8 and 9 feet bsg. Groundwater flow in the shallow aquifer was calculated to be west-southwest at a hydraulic gradient of approximately 0.0006 feet/foot.

- Extensive residual gasoline and diesel hydrocarbon impacts are present in on-and off-site soils. Hydrocarbon saturated “highly contaminated” soils are concentrated along or beneath the groundwater table in the central Rodgers yard area at depths of between approximately 8 to 10 feet bsg.

- Analysis of laboratory chromatograms and hydrocarbon range breakdowns indicate the gasoline hydrocarbons identified at the Site are consistent with heavily to moderately weathered gasoline and diesel. Prior remediation activities and natural biodegradation and dispersion processes have preferentially removed the lighter end TPH compounds (i.e. benzene) from select soils and groundwater at the Site. Prior remedial activities do not appear to have significantly effected the central portion of the soil and groundwater plume.

- Calculations based on currently available data suggest approximately 2,500 gallons (15,000 lbs.) of residual hydrocarbons are present in soils in the Rodgers-derived plume. Lack of available data preclude estimation of soil and groundwater TPH removed by prior remediation systems at the Site.

# *7.0 RECOMMENDATIONS*

Based on the information collected during this investigation and the requirements of the USTR Part XII, FEI/TPA recommends the following actions at the Site:

- Conduct AS/VE Pilot Test.

- Conduct a Tier Two RBCA evaluation to determine if any additional remedial efforts are necessary at the Site.

- Implement quarterly groundwater monitoring at the Site to document plume stability and protect human health and the environment.

# *8.0 REFERENCES*

Billings and Associates, Inc. (1993-1995) Various Reports for the Rodgers Drilling Site located at 2615 Isleta Boulevard, SW, Albuquerque, New Mexico.

Kelly, T.E., (1977) Geology of the Albuquerque Basin, New Mexico; New Mexico Bureau of Mines and Minerals Resources, Memoir 33.

Metric, Corporation (1990) Hydrogeologic Investigation Report for Rodgers and Company, Inc. Property located at 2615 Isleta Blvd., SW, Albuquerque, New Mexico

## *9.0 STATEMENT OF FAMILIARITY*

We are personally familiar with the information presented in this report and it is accurate and complete to the best of our knowledge.

**Faith Engineering, Inc.**

_____

Stuart E. Faith, PE
President
NMCS #80

**Tecumseh Professional Associates, Inc.**

_____

William J. Brown, CPG
Senior Hydrogeologist
NMCS #77

N

SITE

# SITE MAP
## USGS Topographic Map
## Albuquerque, West

**Rodgers Drilling Site**
2615 Isleta Blvd, SW
Albuquerque, New Mexico


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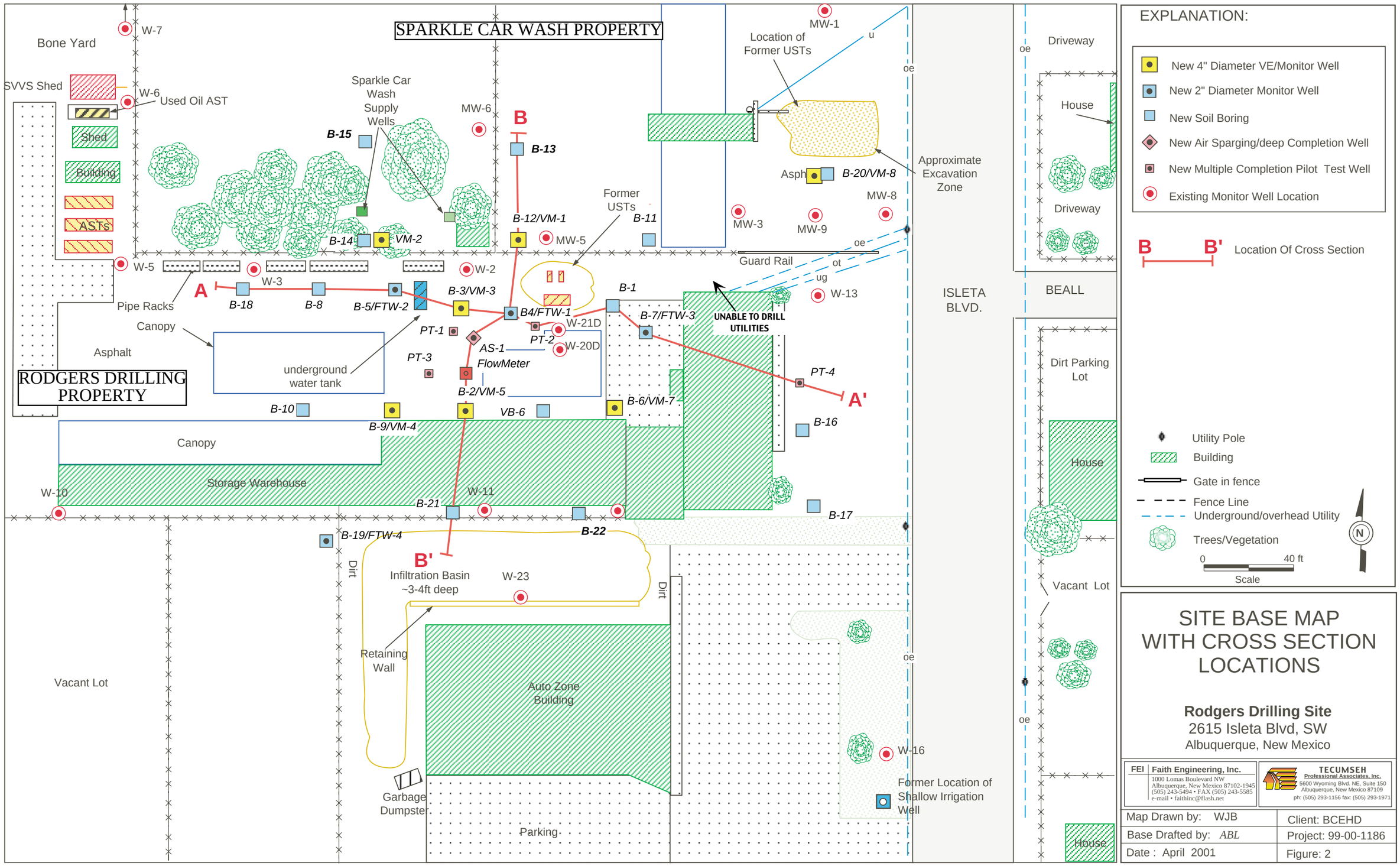
| | |
|---|---|
| Map Drawn by: DCS | Client: BCEHD |
| Scale: 1" = 2000' | Project: 00-01-1186 |
| Date : April 2001 | Figure 1 |




# SITE BASE MAP WITH CROSS SECTION LOCATIONS

**Rodgers Drilling Site**
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| | |
|---|---|
| Map Drawn by: WJB | Client: BCEHD |
| Base Drafted by: *ABL* | Project: 99-00-1186 |
| Date : April 2001 | Figure: 2 |

SPARKLE CAR WASH PROPERTY

RODGERS DRILLING PROPERTY

Bone Yard

W-7

FORMER SVVS REMEDIATION SHED

W-6

Used Oil AST

Shed

Building

ASTs

W-5

W-3

MW-6

PVC RISERS AND WIND TURBINES

Former USTs

MW-5

W-2

Wind Turbine (for Passive VE)

MW-1

Location of Former USTs

Asphalt

Passive VE Active AS System

Approximate Excavation Zone

MW-3

MW-9

MW-8

Guard Rail

W-13

Canopy

Asphalt

W-21D

W-20D

Canopy

Storage Warehouse

W-10

W-11

PVC RISERS AND WIND TURBINES

Dirt

Infiltration Basin ~3-4ft deep

W-23

Dirt

Retaining Wall

Vacant Lot

Auto Zone Building

W-16

Garbage Dumpster

Parking

ISLETA BLVD.

Driveway

House

Driveway

BEALL

Dirt Parking Lot

House

Vacant Lot

House

EXPLANATION:

- Existing Monitor Well Location
- Below Ground SVVS Remediation System Piping
- Above Ground SVVS Remediation System Piping
- Passive Below Ground Vadose Zone Remediation System
- SVVS Remediation Well Nest (Location Approximate)
- Utility Pole
- Building
- Gate in fence
- Fence Line

N

0 40 ft

Scale

# SITE BASE MAP HIGHLIGHTING PREVIOUSLY INSTALLED REMEDIATION SYSTEMS

**Rodgers Drilling Site**
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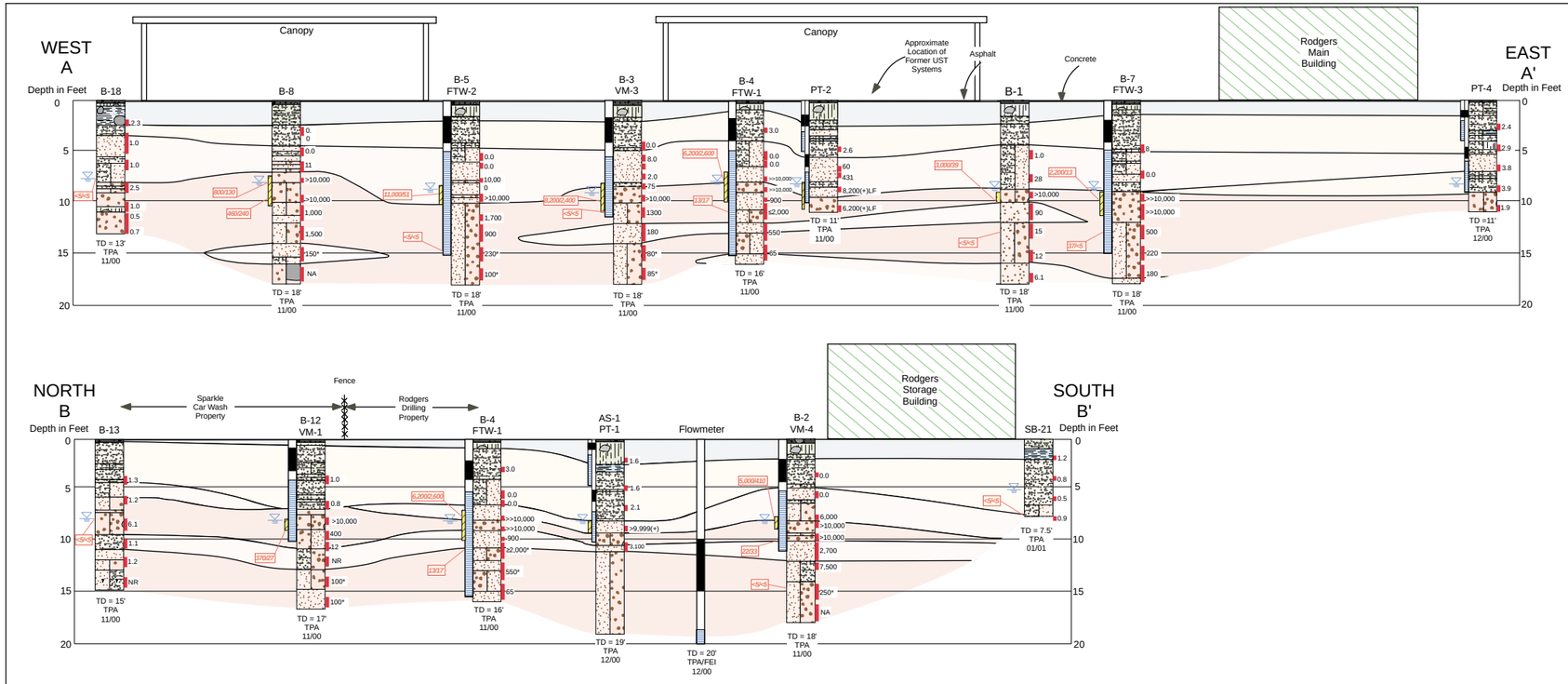
| | |
|---|---|
| Map Drawn by: WJB | Client: BCEHD |
| Base Drafted by: *ABL* | Project: 99-00-1186 |
| Date : April 2001 | Figure: 3 |

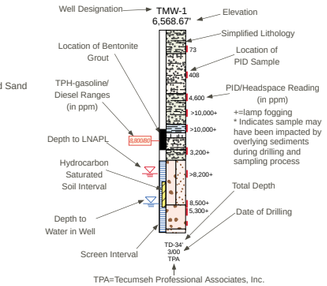



## EXPLANATION

### Lithology

- GC Clayey Gravel
- GM Silty Gravel
- GW Sandy Gravel
- SW Gravelly/Poorly Sorted Sand
- SP Well Sorted Sand
- SM Clayey-Silty Sand
- SC Clayey Sand
- ML Silt
- CL Clay and Silty Clay
- CH Fat Clay
- Fill
- Concrete

### Well Completion Summary




TPA=Tecumseh Professional Associates, Inc.

# All boreholes and wells were continuously sampled using a hand auger and drive split spoon samples.

8ft

1.87X
Vertical
Exaggeration

0 15ft

## GEOLOGIC CROSS SECTIONS A-A' AND B-B'

Rodgers Drilling Site
2615 Isleta Blvd, SW
Albuquerque, New Mexico

| | |
|---|---|
| Map Drawn by: WJB | Client: BCEHD |
| Base Drafted by: OG | Project: 99-00-1186 |
| Date : April 2001 | Figure 4 |

SPARKLE CAR WASH PROPERTY

RODGERS DRILLING PROPERTY

Bone Yard

W-7

SVVS Shed

91.02

W-6

Used Oil AST

Shed

Building

91.00

ASTs

W-5

90.99

W-3

91.00

91.05

91.10

MW-6

MW-1

Location of Former USTs

Asphalt

Approximate Excavation Zone

Former USTs

MW-5

W-2

91.07

MW-3

MW-9

MW-8

Guard Rail

W-13

91.14

Canopy

Asphalt

W-21D

W-20D

91.15*

91.11*

Rodgers Building

Canopy

W-10

90.94

W-11

91.04

91.07

W-14

W-12

91.11

Dirt

Infiltration Basin ~3-4ft deep

W-23

Dirt

Retaining Wall

Auto Zone Building

Vacant Lot

91.10

87.48?

W-16

W-17 (100 feet south

91.05

91.02

Garbage Dumpster

91.00

Parking

ISLETA BLVD.

BEALL

Driveway

House

Driveway

Dirt Parking Lot

House

Vacant Lot

House

EXPLANATION:

91.03 Groundwater Elevation

Inferred Groundwater Flow Direction

Groundwater Isocontour

91.00

Existing Monitor Well Location

Utility Pole

Building

Gate in fence

Fence Line

N

0 40 ft

Scale

# GROUNDWATER POTENTIOMETRIC SURFACE MAP 9-15-00

**Rodgers Drilling Site**

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| | |
|---|---|
| Map Drawn by: WJB | Client: BCEHD |
| Base Drafted by: *ABL* | Project: 99-00-1186 |
| Date : April 2001 | Figure 6 |

SPARKLE CAR WASH PROPERTY

RODGERS DRILLING PROPERTY

Bone Yard

SVVS Shed

Used Oil AST

Shed

Building

ASTs

Canopy

Asphalt

Canopy

Vacant Lot

Location of Former USTs

Former USTs

>100 PPM /V

>1,000 PPM/V

Approximate Excavation Zone

Asphalt

Guard Rail

Infiltration Basin ~3-4ft deep

Retaining Wall

Garbage Dumpster

Parking

Auto Zone Building

Rodgers Building

Dirt

Dirt

Driveway

House

Driveway

ISLETA BLVD.

BEALL

Dirt Parking Lot

House

Vacant Lot

House

B-15 2.7

B-13 6.1

B-14 >10,000

B-11 1,800

B-18 2.5

B-8 >10,000

FTW-2 >10,000

VM-3 >>10,000

VM-1

FTW-1 >10,000

PT-1 >10,000

PT-2

AS-1 >8200+

PT-3 >10,000

FlowMeter

VM-5

B-10 900

VM-4 >10,000

VB-6 >4500+

VM-7 >10,000

B-1 >10,000

FTW-3 >10,000

PT-4 3.9

B-16 21

B-21

B-22

0.9 B-17

FTW-4 65

1.2

1.2

MW-1

MW-3

MW-9

MW-8

VM-8 >10,000

W-13

EXPLANATION:

- New 4" Diameter VE/Monitor Well
- New 2" Diameter Monitor Well
- New Soil Boring
- New Air Sparging/deep Completion Well
- New Multiple Completion Pilot Test Well
- Existing Monitor Well Location
- 344 — Maximum Soil Headspace Concentration (In parts per million/volume (ppm/v))
- >100 PPM/V — Soil Headspace Isocontour (In parts per million/volume (ppm/v))
- Utility Pole
- Building
- Gate in fence
- Fence Line

N

0 40 ft

Scale

# SOIL HEADSPACE ISOCONCENTRATION MAP

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| | |
|---|---|
| Map Drawn by: WJB | Client: BCEHD |
| Base Drafted by: *ABL* | Project: 99-00-1186 |
| Date : April 2001 | Figure 7 |

SPARKLE CAR WASH PROPERTY

RODGERS DRILLING PROPERTY

Bone Yard

SVVS Shed

Used Oil AST

Shed

Building

ASTs

Canopy

Asphalt

>100 PPM DIESEL

>1000 PPM DIESEL

B-15 <5/<5

B-13 <5/<5

B-14 6600/2200 VM-2

B-11 370/27 VM-1

B-18 <5/<5

B-8 800/240

FTW-2 11,000/51

VM-3 8200/2400

FTW-1 6200/2600

PT-1

PT-2

AS-1

PT-3

3400/1500

FlowMeter

VM-5

B-10 <5/<5

VM-4 3900/63

5000/410

VB-6 980/11

B-1 3000/39

FTW-3

2700/13

VM-7 4300/34

Rodgers Building

B-16 <5/<5

B-17

B-21 <5/<5

B-22 <5/<5

FTW-4 <5/<5

Former USTs

Location of Former USTs

MW-1

Asphalt

VM-8 4000/80

MW-8

MW-3

MW-9

W-13

PT-4

Guard Rail

Approximate Excavation Zone

>100 PPM GASOLINE

>1000 PPM GASOLINE

Infiltration Basin ~3-4ft deep

Dirt

Dirt

Retaining Wall

Auto Zone Building

Garbage Dumpster

Parking

Vacant Lot

Vacant Lot

ISLETA BLVD.

Driveway

House

Driveway

BEALL

Dirt Parking Lot

House

House

## EXPLANATION:

- New 4" Diameter VE/Monitor Well
- New 2" Diameter Monitor Well
- New Soil Boring
- New Air Sparging/deep Completion Well
- New Multiple Completion Pilot Test Well
- Existing Monitor Well Location

110/230 Maximum Soil Total Petroleum Hydrocarbons (TPH) Concentration (In parts per million (ppm))

Diesel Range TPH

Gasoline Range TPH

>100 PPM — TPH gasoline range Isocontour (in ppm)

>100 PPM — TPH diesel range Isocontour (in ppm)

Utility Pole

Building

Gate in fence

Fence Line

N

0 40 ft

Scale

# SOIL TOTAL PETROLEUM HYDROCARBONS (TPH) ISOCONCENTRATION MAP

**Rodgers Drilling Site**
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| | |
|---|---|
| Map Drawn by: WJB | Client: BCEHD |
| Base Drafted by: *ABL* | Project: 99-00-1186 |
| Date : April 2001 | Figure 8 |

SPARKLE CAR WASH PROPERTY

RODGERS DRILLING PROPERTY

ISLETA BLVD.

BEALL

Driveway

House

Driveway

Dirt Parking Lot

House

Vacant Lot

House

Bone Yard

SVVS Shed

Shed

Building

ASTs

Used Oil AST

Canopy

Asphalt

Canopy

Asphalt

Location of Former USTs

Approximate Excavation Zone

Former USTs

Guard Rail

Rodgers Building

Auto Zone Building

Infiltration Basin ~3-4ft deep

Retaining Wall

Garbage Dumpster

Parking

Vacant Lot

Dirt

>10 ppb Benzene

>100 ppb Benzene

>1000 ppb Benzene

FlowMeter

W-7 9/00 ND

W-6 1/01 B=<10 T=190 E=1300 X=2000 TB=1700 N=310

W-5 9/00 ND

W-3 9/00 B=<1 T=<1 E=2.5 X=4.5 TB=<2 N=<1

W-2 1/01 B=<10 T=2800 E=1100 X=4400 TB=1240 N=210

MW-6 1/01 B=<10 T=760 E=1500 X=3300 TB=1790 N=830

MW-5 9/00 B=<5 T=<5 E=240 X=423 TB=1640 N=130

MW-1 9/00 B=<1 T=<1 E=<1 X=<2 TB=4.4 N=<1

MW-3 9/00 ND

MW-9 1/01 B=<10 T=1100 E=1200 X=3100 TB=1350 N=759

MW-8 9/00 ND

W-13 9/00 ND

W-21D 1/01 B=<10 T=440 E=900 X=5600 TB=1770 N=279

W-20D 1/01 B=<10 T=2600 E=1100 X=4000 TB=1390 N=260

W-10 9/00 ND

W-11 9/00 B=2300 T=<20 E=1400 X=1020 TB=340 N=390

W-14 1/01 B=6600 T=4100 E=2300 X=6600 TB=2020 N=360

W-12 1/01 B=8700 T=13000 E=1500 X=8500 TB=1610 N=418

W-23 9/00 B=<1 T=<1 E=<1 X=<2 TB=19.4 N=1.8

W-16 9/00 B=<1 T=<1 E=<1 X=<2 TB=19.4 N=1.8

9/00 ND

1/01 B=<10 T=1100 E=1200 X=3100 TB=1350 N=759

1/01 B=<10 T=190 E=1300 X=2000 TB=1700 N=310

1/01 B=<10 T=2800 E=1100 X=4400 TB=1240 N=210

1/01 B=<10 T=760 E=1500 X=3300 TB=1790 N=830

1/01 B=<10 T=2600 E=1100 X=4000 TB=1390 N=260

1/01 B=6600 T=4100 E=2300 X=6600 TB=2020 N=360

1/01 B=8700 T=13000 E=1500 X=8500 TB=1610 N=418

1/01 B=260 T=9600 E=2000 X=8500 TB=1960 N=380

1/01 ND

VM-1 VM-2 VM-3 VM-4 VM-5 VM-7 VM-8

FTW-1 FTW-2 FTW-3 FTW-4

PT-1 PT-2 PT-3 PT-4 AS-1

MW-1 MW-3 MW-5 MW-6 MW-8 MW-9

W-1 W-2 W-3 W-5 W-6 W-7 W-10 W-11 W-12 W-13 W-14 W-16 W-20D W-21D W-23

EXPLANATION:

- New 4" Diameter VE/Monitor Well
- New 2" Diameter Monitor Well
- New Soil Boring
- New Air Sparging/deep Completion Well
- New Multiple Completion Pilot Test Well
- Existing Monitor Well Location

>100 ppb — Benzene Groundwater Isocontour (in ppb)

Groundwater Quality Data (in ppb)

| | |
|---|---|
| 9/00 | Date of Sampling |
| B=<1 | B=Benzene |
| T=<1 | T=Toluene |
| E=<1 | E=Ethyl Benzene |
| X=<2 | X=Total Xylenes |
| TB=<2 | TB=Trimethyl Benzenes |
| N=<2 | N=Naphthalenes |

ND=Non-detect for analyzed compounds

- Utility Pole
- Building
- Gate in fence
- Fence Line

Figure 8

N

0 40 ft

Scale

# BENZENE GROUNDWATER QUALITY ISOCONCENTRATION MAP 9-00 and 1-01

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| | |
|---|---|
| Map Drawn by: WJB | Client: BCEHD |
| Base Drafted by: *ABL* | Project: 99-00-1186 |
| Date : April 2001 | Figure: 9 |

SPARKLE CAR WASH PROPERTY

RODGERS DRILLING PROPERTY

Bone Yard
W-7
9/00 ND
SVVS Shed
W-6
Used Oil AST
Shed
Building
ASTs
W-5
9/00 ND
Canopy
Asphalt
Canopy
W-10
>620 ppb Xylenes
>6200 ppb Xylenes
9/00 ND
Vacant Lot

1/01 B=<10 T=190 E=1300 X=2000 TB=1700 N=310
1/01 B=<10 T=2800 E=1100 X=4400 TB=1240 N=210
9/00 B=<1 T=<1 E=2.5 X=4.5 TB=<2 N=<1
W-3
1/01 B=<10 T=1100 E=1200 X=3100 TB=1350 N=759
1/01 B=6600 T=4100 E=2300 X=6600 TB=2020 N=360
1/01 ND
FTW-4
Dirt

MW-6
9/00 B=<5 T=<5 E=240 X=423 TB=1640 N=130
1/01 B=<10 T=190 E=1500 X=3300 TB=1790 N=830
9/00 B=<1 T=<1 E=<1 X=<2 TB=4.4 N=<1
VM-2
VM-1
W-2
VM-3
MW-5
Former USTs
FTW-2
FTW-1
PT-1
AS-1
PT-2
PT-3
FlowMeter
VM-5
VM-4
1/01 B=8700 T=13000 E=1500 X=8500 TB=1610 N=418
9/00 B=2300 T=<20 E=1400 X=1020 TB=340 N=390
W-11
W-14
Infiltration Basin ~3-4ft deep
W-23
9/00 ND
Retaining Wall
Garbage Dumpster
Parking
Auto Zone Building

1/01 B=<10 T=440 E=900 X=5600 TB=1770 N=279
W-21D
W-20D
FTW-3
VM-7
1/01 B=<10 T=2600 E=1100 X=4000 TB=1390 N=260
9/00 ND
Rodgers Building
1/01 B=260 T=9600 E=2000 X=8500 TB=1960 N=380
PT-4
9/00 B=<1 T=<1 E=<1 X=<2 TB=19.4 N=1.8
W-12
9/00 ND
W-16

MW-1
Location of Former USTs
Asphalt
VM-8
Approximate Excavation Zone
9/00 ND
MW-3
MW-9
MW-8
9/00 ND
Guard Rail
9/00 B=<1 T=<1 E=120 X=38 TB=<2 N=<1
W-13
9/00 ND
ISLETA BLVD.

Driveway
House
Driveway
BEALL
Dirt Parking Lot
House
Vacant Lot
House

## EXPLANATION:

- New 4" Diameter VE/Monitor Well
- New 2" Diameter Monitor Well
- New Soil Boring
- New Air Sparging/deep Completion Well
- New Multiple Completion Pilot Test Well
- Existing Monitor Well Location

>620 ppb — Total Xylenes Groundwater Isocontour (in ppb)

Groundwater Quality Data (in ppb)

| 9/00 | Date of Sampling |
|---|---|
| B=<1 | B=Benzene |
| T=<1 | T=Toluene |
| E=<1 | E=Ethyl Benzene |
| X=<2 | X=Total Xylenes |
| TB=<2 | TB=Trimethyl Benzenes |
| N=<2 | N=Naphthalenes |

ND=Non-detect for analyzed compounds

- Utility Pole
- Building
- Gate in fence
- Fence Line

Figure 8

N

0 40 ft
Scale

# TOTAL XYLENES GROUNDWATER QUALITY ISOCONCENTRATION MAP 9-00 and 1-01

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| | |
|---|---|
| Map Drawn by: WJB | Client: BCEHD |
| Base Drafted by: *ABL* | Project: 99-00-1186 |
| Date : April 2001 | Figure: 10 |

**TABLE 1**
**00-01-1186-01 • Rodger's 2615 Isleta Blvd. SW**
**NMED FACILITY #30287**
SUMMARY OF GROUND WATER LEVEL MEASUREMENTS OF NEW WELLS

| WELL NUMBER | ELEVATION (feet above datum) | DATE | STATIC (feet BG) | WATER LEVEL (feet AD) | (+) = RISING (-) = FALLING |
|---|---|---|---|---|---|
| **VM-1** | † | 1/16/01 | 7.00 | * | ** |
| **VM-2** | † | 1/16/01 | 7.12 | * | ** |
| **VM-3** | † | 1/16/01 | 7.38 | * | ** |
| **VM-4** | † | 1/16/01 | 7.45 | * | ** |
| **VM-5** | † | 1/16/01 | 7.56 | * | ** |
| **VM-7** | † | 1/16/01 | 9.23 | * | ** |
| **FTW-1** | † | 1/16/01 | 7.74 | * | ** |
| **FTW-2** | † | 1/16/01 | 7.10 | * | ** |
| **FTW-3** | † | 1/16/01 | 8.21 | * | ** |
| **FTW-4** | † | 1/16/01 | 6.93 | * | ** |

† - pending survey and drill completion

* - not determined, pending elevation

** - will be determined with another measurement

Data checked _____ / _____

**TABLE 1**
**00-01-1186-01 • Rodger's 2615 Isleta Blvd. SW**
**NMED FACILITY #30287**
SUMMARY OF GROUND WATER LEVEL MEASUREMENTS OF EXISTING WELLS

| WELL NUMBER | ELEVATION (feet above datum) | DATE | STATIC (feet BG) | WATER LEVEL (feet AD) | (+) = RISING (-) = FALLING |
|---|---|---|---|---|---|
| MW-3 | † | 9/25/00 | 8.63 | * | ** |
| MW-5 | † | 9/25/00 | 7.68 | * | ** |
| MW-8 | † | 9/26/00 | 7.64 | * | ** |
| W-2 | † | 9/25/00 | 7.88 | * | ** |
| W-3 | † | 9/25/00 | 7.07 | * | ** |
| W-5 | † | 9/25/00 | 6.69 | * | ** |
| W-6 | † | 9/25/00 | 6.46 | * | ** |
| W-10 | † | 9/25/00 | 7.11 | * | ** |
| W-11 | † | 9/25/00 | 7.98 | * | ** |
| W-12 | † | 9/26/00 | 8.34 | * | ** |
| W-13 | † | 9/25/00 | 7.93 | * | ** |
| W-14 | † | 9/25/00 | 8.72 | * | ** |
| W-16 | † | 9/26/00 | 11.06 | * | ** |
| W-17 | † | 9/26/00 | 6.63 | * | ** |
| W-20D | † | 9/26/00 | 8.43 | * | ** |
| W-21 | † | 9/26/00 | 8.43 | * | ** |
| W-23 | † | 9/26/00 | 6.51 | * | ** |
| MW-9 | † | 9/25/00 | 8.22 | * | ** |

† - pending survey and drill completion
* - not determined, pending elevation
** - will be determined with another measurement

Data checked _____ / _____

**TABLE 2**
**RODGER'S DRILLING**
**00-01-1186-03 • NMED FACILITY # 30287**
SOIL BORING ANALYSIS RESULTS
EPA Method 8015 GRO/DRO

| | | HYDROCARBONS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8015B MODIFIED GRO | | | | | | | | | | |
| **LOCATION** | **DATE SAMPLED** | **<C5** | **C5-C6** | **C6-C7** | **C7-C8** | **C8-C9** | **C9-C10** | **C10-C11** | **C-11-C12** | **C12-C14** | **C14+** | **TOTAL GRO** |
| **UNITS** | | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** |
| **STANDARDS** | | | | | | | | | | | | **100** |
| **B-1-10' (SW/GW)** | **11/2/00** | 0.0 | 222 | 591 | 543 | 297 | 447 | 456 | 261 | 165 | 18 | **3,000** |
| **B-1-12'-14' (SP/SW)** | **11/2/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-2-7.5'-8.5' (SP/SW)** | **11/1/00** | 10.0 | 240.0 | 690.0 | 760.0 | 685.0 | 990.0 | 845.0 | 465.0 | 270.0 | 45.0 | **5,000** |
| **B-2-10' (SW)** | **11/1/00** | 0.0 | 1.5 | 3.6 | 3.9 | 3.0 | 3.5 | 2.9 | 2.0 | 1.4 | 0.2 | 22 |
| **B-2-14'-16' (SP/SW)** | **11/1/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-3-10' (SW)** | **11/1/00** | 8.2 | 492.0 | 1320.2 | 1303.8 | 1074.2 | 1549.8 | 1074.2 | 623.2 | 524.8 | 229.6 | **8200** |
| **B-3-14'-16' (SP/SW)** | **11/1/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-4-8' (SP)** | **11/1/00** | 0.0 | 316.2 | 911.4 | 892.7 | 421.6 | 1252.4 | 1109.7 | 570.4 | 477.6 | 248.0 | **6200** |
| **B-4-11' (SP/SW)** | **11/1/00** | 0.0 | 0.7 | 2.7 | 2.3 | 1.8 | 5.5 | - | - | - | - | 13 |
| **B-5-9' (SP)** | **11/1/00** | 0.0 | 792.0 | 2101.0 | 2057.0 | 1034.0 | 2332.0 | 1507.0 | 759.0 | 385.0 | 33.0 | **11000** |
| **B-5-14'-16' (SP/SW)** | **11/1/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-6-9.5'-10' (SP)** | **11/3/00** | 0.0 | 322.5 | 653.6 | 468.7 | 546.1 | 941.7 | 761.1 | 356.9 | 210.7 | 38.7 | **4300** |
| **B-6-12'-14' (SP)** | **11/3/00** | 0.000 | 0.499 | 1.670 | 1.642 | 1.066 | 2.064 | 1.440 | 0.672 | 0.461 | 0.086 | 9.6 |
| **B-8-8' (SW)** | **11/3/00** | 0.0 | 29.6 | 100.0 | 134.4 | 62.4 | 111.2 | 164.0 | 93.6 | 84.8 | 20.0 | **800** |
| **B-8-10' (SW/GW)** | **11/3/00** | 0.0 | 11.5 | 57.5 | 67.2 | 42.8 | 45.1 | 53.8 | 70.8 | 89.2 | 22.1 | **460** |

**TABLE 2**
**RODGER'S DRILLING**
**00-01-1186-03 • NMED FACILITY # 30287**
SOIL BORING ANALYSIS RESULTS
EPA Method 8015 GRO/DRO

| | | HYDROCARBONS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8015B MODIFIED GRO | | | | | | | | | | |
| **LOCATION** | **DATE SAMPLED** | <C5 | C5-C6 | C6-C7 | C7-C8 | C8-C9 | C9-C10 | C10-C11 | C-11-C12 | C12-C14 | C14+ | TOTAL GRO |
| **UNITS** | | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| **STANDARDS** | | | | | | | | | | | | 100 |
| **B-9-9' (SW)** | **11/5/00** | 0.0 | 249.6 | 713.7 | 729.3 | 409.5 | 682.5 | 569.4 | 304.2 | 210.6 | 31.2 | **3,900** |
| **B-9-12'-14' (SW)** | **11/5/00** | 0.0 | 1.0 | 2.6 | 2.7 | 1.9 | 3.1 | 2.2 | 1.4 | 1.6 | 0.5 | 17 |
| **B-10-9.5' (SW/GW)** | **11/5/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-11-9.5' (SP/SW)** | **11/5/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-11-10.5' (SW/GW)** | **11/5/00** | 0.0 | 0.0 | 3.6 | 8.9 | 16.0 | 24.5 | 21.2 | 17.9 | 15.4 | 2.5 | **110** |
| **B-12-9' (SW/GW)** | **11/5/00** | 0.0 | 9.6 | 33.3 | 42.2 | 30.3 | 51.5 | 76.2 | 57.7 | 58.8 | 10.4 | **370** |
| **B-13-9' (SW/GW)** | **11/6/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-14-6.5'-7' (SP)** | **11/6/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-14-8.5' (SW/GW)** | **11/6/00** | 0.0 | 316.8 | 963.6 | 1366.2 | 646.8 | 686.4 | 1174.8 | 666.6 | 561.0 | 217.8 | **6,600** |
| **B-15-8.5' (SM/SP)** | **11/6/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-16-8' (SM)** | **11/10/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-18-8' (SM/SP)** | **11/10/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-19-9' (SW)** | **11/10/00** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-20-8.5' (SM/SP)** | **11/10/00** | 0.0 | 108.0 | 784.0 | 892.0 | 304.0 | 720.0 | 652.0 | 316.0 | 192.0 | 32.0 | **4,000** |
| **B-20-9.5' (SW)** | **11/10/00** | 0.0 | 51.6 | 295.2 | 330.0 | 117.6 | 98.4 | 135.6 | 97.2 | 61.2 | 13.2 | **1,200** |
| **FTW-3 9.5' (SW)** | **11/3/00** | 0.0 | 134.2 | 235.4 | 411.4 | 244.2 | 319.0 | 409.2 | 248.6 | 169.4 | 28.6 | **2,200** |
| **FTW-3-12'-14' (SP/SW)** | **11/3/00** | 0.0 | 3.8 | 7.3 | 5.6 | 4.6 | 4.3 | 5.5 | 3.4 | 2.2 | 0.3 | 37 |

**BOLD** - Above NMED Standards
* - Not Sampled

Data checked _____ / _____

*4/18/01*

**TABLE 2**
**RODGER'S DRILLING**
**00-01-1186-03 • NMED FACILITY # 30287**
SOIL BORING ANALYSIS RESULTS
EPA Method 8015 GRO/DRO

| | | HYDROCARBONS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 8015B MODIFIED DRO | | | | | | | |
| **LOCATION** | **DATE SAMPLED** | C10-C12 | C12-C14 | C14-C16 | C16-18 | C18-C20 | C20-24 | C24+ | TOTAL DRO |
| **UNITS** | | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** |
| **STANDARDS** | | | | | | | | | **100** |
| **B-1-10' (SW/GW)** | **11/2/00** | - | - | 30.81 | 5.46 | 1.755 | 0.975 | - | 39 |
| **B-1-12'-14' (SP/SW)** | **11/2/00** | ND | ND | ND | ND | ND | ND | - | ND |
| **B-2-7.5'-8.5' (SP/SW)** | **11/1/00** | - | - | 188.6 | 114.8 | 69.7 | 36.9 | - | **410** |
| **B-2-10' (SW)** | **11/1/00** | - | - | 15.708 | 10.956 | 6.336 | - | - | 33 |
| **B-2-14'-16' (SP/SW)** | **11/1/00** | ND | ND | ND | ND | ND | ND | - | ND |
| **B-3-10' (SW)** | **11/1/00** | - | - | 984 | 672 | 480 | 264 | - | **2400** |
| **B-3-14'-16' (SP/SW)** | **11/1/00** | ND | ND | ND | ND | ND | ND | - | ND |
| **B-4-8' (SP)** | **11/1/00** | - | - | 1085.5 | 617.5 | 643.5 | 253.5 | - | **2600** |
| **B-4-11' (SP/SW)** | **11/1/00** | 4.08 | 4.59 | 4.59 | 3.06 | 0.493 | 0.187 | - | 17 |
| **B-5-9' (SP)** | **11/1/00** | - | - | 31.11 | 12.75 | 5.1 | 2.04 | - | 51 |
| **B-5-14'-16' (SP/SW)** | **11/1/00** | ND | ND | ND | ND | ND | ND | - | ND |
| **B-6-9.5'-10' (SP)** | **11/3/00** | - | - | 26.18 | 4.76 | 2.414 | 0.646 | - | 34 |
| **B-6-12'-14' (SP)** | **11/3/00** | ND | ND | ND | ND | ND | ND | - | ND |
| **B-8-8' (SW)** | **11/3/00** | - | - | 65 | 32.5 | 22.1 | 10.4 | - | **130** |
| **B-8-10' (SW/GW)** | **11/3/00** | - | - | 117.6 | 33.6 | 57.6 | 31.2 | - | **240** |

**TABLE 2**
**RODGER'S DRILLING**
**00-01-1186-03 • NMED FACILITY # 30287**
SOIL BORING ANALYSIS RESULTS
EPA Method 8015 GRO/DRO

| | | HYDROCARBONS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 8015B MODIFIED DRO | | | | | | | |
| **LOCATION** | **DATE SAMPLED** | C10-C12 | C12-C14 | C14-C16 | C16-18 | C18-C20 | C20-24 | C24+ | TOTAL DRO |
| **UNITS** | | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** |
| **STANDARDS** | | | | | | | | | **100** |
| **B-9-9' (SW)** | **11/5/00** | * | 0.0 | 46.872 | 8.2 | 4.347 | 3.581 | 0.0 | 63 |
| **B-9-12'-14' (SW)** | **11/5/00** | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-10-9.5' (SW/GW)** | **11/5/00** | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-11-9.5' (SP/SW)** | **11/5/00** | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-11-10.5' (SW/GW)** | **11/5/00** | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-12-9' (SW/GW)** | **11/5/00** | * | 0.0 | 16.875 | 5.292 | 4.428 | 0.405 | 0.0 | 27 |
| **B-13-9' (SW/GW)** | **11/6/00** | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-14-6.5'-7' (SP)** | **11/6/00** | * | 110 | 500 | 700 | 378 | 312 | 0.0 | **2000** |
| **B-14-8.5' (SW/GW)** | **11/6/00** | * | 0.0 | 883.85 | 509.85 | 509.85 | 296.45 | 0.0 | **2200** |
| **B-15-8.5' (SM/SP)** | **11/6/00** | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-16-8' (SM)** | **11/10/00** | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-18-8' (SM/SP)** | **11/10/00** | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-19-9' (SW)** | **11/10/00** | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-20-8.5' (SM/SP)** | **11/10/00** | * | 0.0 | 55.52 | 13.68 | 7.44 | 3.36 | 0.0 | 80 |
| **B-20-9.5' (SW)** | **11/10/00** | * | 0.0 | 38.124 | 8.694 | 4.212 | 2.97 | 0.0 | 54 |
| **FTW-3 9.5' (SW)** | **11/3/00** | - | - | 10.01 | 2.08 | 0.546 | 0.364 | ND | 13 |
| **FTW-3-12'-14' (SP/SW)** | **11/3/00** | ND | ND | ND | ND | ND | ND | ND | ND |

**BOLD** - Above NMED Standards
* - Not Sampled

Data checked _____ / _____

**TABLE 2**
**RODGER'S DRILLING**
**00-01-1186-03 • NMED FACILITY # 30287**
SOIL BORING ANALYSIS RESULTS
EPA Method 8260

| | | ORGANICS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LOCATION** | **DATE SAMPLED** | Benzene | Toluene | Ethylbenzene | Total Xylenes | Total BTEX | MTBE | EDB | EDC | TMB | Naphthalene | 1-Methylnaphthalene | 2-Methylnaphthalene |
| **UNITS** | | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** |
| **STANDARDS** | | | | | | **50** | | | | | | | |
| **FTW-3 9.5' (SW)** | 11/3/00 | < 5.0 | 18 | 38 | 140 | **196** | < 5.0 | < 5.0 | < 5.0 | 143 | 13 | < 10 | 19 |
| **FTW-3-12'-14' (SP/SW)** | 11/3/00 | ND | 0.1 | 0.26 | 0.8 | 1.16 | ND | ND | ND | 1.39 | ND | ND | 0.16 |
| **B-1-10' (SW/GW)** | 11/3/01 | < 5.0 | 23 | 47 | 180 | **250** | < 5.0 | < 5.0 | < 5.0 | 119 | < 10 | < 10 | < 10 |
| **B-1-12'-14' (SP/SW)** | 11/3/00 | ND | ND | ND | 0.05 | 0.05 | ND | ND | ND | 0.06 | ND | ND | ND |
| **B-2-7.5'-8.5' (SP/SW)** | 11/3/00 | 41 | 290 | 77 | 430 | **838** | < 5.0 | < 5.0 | < 5.0 | 198 | 14 | < 10 | 18 |
| **B-2-10' (SW)** | 11/3/00 | 0.26 | 0.80 | 0.35 | 1.3 | 2.71 | ND | ND | ND | 0.83 | 0.14 | 0.15 | 0.26 |
| **B-2-14'-16' (SP/SW)** | 11/3/00 | ND | 0.13 | ND | 0.17 | 0.30 | ND | ND | ND | 0.05 | ND | ND | ND |
| **B-3-10' (SW)** | 11/3/00 | < 5.0 | 290 | 130 | 640 | **1060** | < 5.0 | < 5.0 | < 5.0 | 250 | 30 | 22 | 36 |
| **B-3-14'-16' (SP/SW)** | 11/3/00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-4-8' (SP)** | 11/3/00 | < 10 | 22 | 150 | 510 | **682** | < 10 | < 10 | < 10 | 302 | 42 | 52 | 61 |
| **B-4-11' (SP/SW)** | 11/3/00 | ND | 0.47 | 0.57 | 2.4 | 3.44 | ND | ND | ND | 0.72 | 0.11 | ND | 0.10 |
| **B-5-9' (SP)** | 11/3/00 | < 10 | 21 | 190 | 1000 | **1211** | <10 | <10 | <10 | 390 | 19 | 5.0 | 10 |
| **B-5-14'-16' (SP/SW)** | 11/3/00 | ND | 0.13 | 0.1 | 0.51 | 0.74 | ND | ND | ND | 0.08 | ND | ND | ND |
| **B-6-9.5'-10' (SP)** | 11/3/00 | < 10 | 200 | 100 | 500 | **800** | <10 | <10 | <20 | 228 | 27 | 14 | 24 |
| **B-6-12'-14' (SP)** | 11/3/00 | ND | 0.18 | 0.27 | 0.84 | 1.29 | ND | ND | ND | 0.39 | ND | ND | ND |
| **B-8-8' (SW)** | 11/3/00 | < 2.5 | < 2.5 | 14 | 45 | **59** | < 2.5 | < 2.5 | < 2.5 | 51 | 2.0 | 4.4 | 5.3 |
| **B-8-10' (SW/GW)** | 11/3/00 | < 1.0 | < 1.0 | 2.1 | < 1.0 | 2.1 | < 1.0 | < 1.0 | < 1.0 | < 9.9 | 2.0 | 10 | 3.5 |

**TABLE 2**
**RODGER'S DRILLING**
**00-01-1186-03 • NMED FACILITY # 30287**
SOIL BORING ANALYSIS RESULTS
EPA Method 8260

| | | ORGANICS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LOCATION** | **DATE SAMPLED** | Benzene | Toluene | Ethylbenzene | Total Xylenes | Total BTEX | MTBE | EDB | EDC | TMB | Naphthalene | 1-Methylnaphthalene | 2-Methylnaphthalene |
| **UNITS** | | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** | **mg/Kg** |
| **STANDARDS** | | | | | | **50** | | | | | | | |
| **B-9-9' (SW)** | 11/5/00 | 14 | 87 | 67 | 290 | **458** | ND | ND | ND | 140 | 13 | 10 | 20 |
| **B-9-12'-14' (SW)** | 11/5/00 | 0.12 | 0.53 | 0.36 | 1.5 | 2.51 | ND | ND | ND | 0.69 | 0.13 | 0.11 | 0.21 |
| **B-10-9.5' (SW/GW)** | 11/5/00 | 0.15 | ND | 0.26 | ND | 0.41 | ND | ND | ND | ND | ND | ND | ND |
| **B-11-9.5' (SP/SW)** | 11/5/00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-11-10.5' (SW/GW)** | 11/5/00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-12-9' (SW/GW)** | 11/5/00 | ND | ND | 7.1 | 13 | 20.1 | ND | ND | ND | 20.8 | 2.8 | 2.1 | 3.4 |
| **B-13-9' (SW/GW)** | 11/6/00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-14-6.5'-7' (SP)** | 11/6/00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-14-8.5' (SW/GW)** | 11/6/00 | ND | ND | 68 | 120 | **188** | ND | ND | ND | 279 | 23 | 31 | 43 |
| **B-15-8.5' (SM/SP)** | 11/6/00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-16-8' (SM)** | 11/10/00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-18-8' (SM/SP)** | 11/10/00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **B-19-9' (SW)** | 11/10/00 | 0.21 | ND | ND | ND | 0.21 | ND | ND | ND | ND | ND | ND | ND |
| **B-20-8.5' (SM/SP)** | 11/10/00 | ND | ND | 88 | 320 | **408** | ND | ND | ND | 178 | 7.2/18* | 4.5/11* | 8.5/21* |
| **B-20-9.5' (SW)** | 11/10/00 | ND | ND | 18 | 12 | 30 | ND | ND | ND | 33 | ND | ND | ND |

**BOLD** - Above NMED Standards

* - 8260/8310 Methodology

Data checked _____ / _____

**TABLE 2**
**RODGER'S DRILLING**
**00-01-1186-03 • NMED FACILITY # 30287**
SOIL BORING ANALYSIS RESULTS
Lead TCLP

| LOCATION | DATE SAMPLED | LEAD RESULTS | UNITS |
|---|---|---|---|
| **B-2-10' (SW)** | 11/3/00 | 2.2 | **mg/Kg** |
| **B-4-8' (SP)** | 11/3/00 | 7.2 | |
| **B-5-9' (SP)** | 11/3/00 | 5.4 | |
| **B-8-8' (SW)** | 11/3/00 | 2.9 | |
| **B-8-10' (SW/GW)** | 11/3/00 | 4.2 | |
| **B-14-8.5' (SW/GW)** | 11/6/00 | 0.08 | **mg/L** |
| **B-20-8.5' (SM/SP)** | 11/10/00 | 0.08 | |

Data checked _____ / _____

**TABLE 3**
**Rodger's 2615 Isleta**
**00-01-1186-03 • NMED FACILITY #30287**
CURRENT GROUND WATER ANNALYSIS RESULTS

| | | ORGANICS | | | | | | | | | | | INORGANICS | | | | | | | INDICATORS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LOCATION** | **DATE SAMPLED** | Benzene | Toluene | Ethylbenzene | Total Xylenes | MTBE | EDB | EDC | TMB | NAPHTHALENE | 1-METHYL NAPHTHALENE | 2-METHYL NAPHTHALENE | IRON | | PHOSPHORUS | SULFATE | ALKALINITY as BICARBONATE | DISS CO2 | NITRATE | pH | CONDUCTIVITY | TEMP |
| **UNITS** | | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | mg/l | | mg/l | mg/l | mg/l | mg/l | mg/l | | µmhos/ | ˚C |
| **STANDARDS** | | 10 | 750 | 750 | 620 | 100 | 0.1 | 10 | | 30 | | | SOLUBLE | TOTAL | | 600 | | | 10 | | cm | |
| **VM - 1** | 1/16/01 | ND | **760** | **1500** | **3300** | ND | ND | ND | 1790 | **350/340*** | 230/290* | 260/200* | < 0.02 | 7.56 | < 0.5 | 250 | 930 | 0.83 | < 0.5 | 8.07 | 125.4 | 13.1 |
| **VM - 2** | 1/16/01 | ND | 190 | **1300** | **2000** | ND | ND | ND | 1700 | **310** | ND | ND | < 0.02 | 3.30 | < 0.5 | 280 | 820 | 0.74 | < 0.5 | 7.81 | 100.8 | 14.0 |
| **VM - 3** | 1/16/01 | ND | **2800** | **1100** | **4400** | ND | ND | ND | 1240 | **210** | ND | ND | 0.07 | 14.3 | < 0.5 | 400 | 710 | 0.43 | < 0.5 | 7.63 | 231.0 | 15.5 |
| **VM - 4** | 1/16/01 | **6600** | **4100** | **2300** | **6600** | ND | ND | ND | 2020 | **360** | ND | ND | 0.15 | 11.7 | < 0.5 | 1.1 | 990 | 0.63 | < 0.5 | 7.29 | 166.2 | 13.6 |
| **VM - 5** | 1/16/01 | **8700** | **13000** | **1500** | **8500** | ND | ND | ND | 1610 | **270/270*** | ND/59* | ND/89* | 0.05 | 7.98 | < 0.5 | 240 | 780 | 0.82 | < 0.5 | 7.45 | 203.0 | 14.1 |
| **VM - 7** | 1/16/01 | **260** | **9600** | **2000** | **8500** | ND | ND | ND | 1960 | **380** | ND | ND | 0.03 | 2.19 | < 0.5 | 52 | 880 | 1.20 | < 0.1 | 7.60 | 194.0 | 13.2 |
| **FTW - 1** | 1/16/01 | ND | 440 | **900** | **5600** | ND | ND | ND | 1770 | **280/160*** | ND/43* | ND/76* | < 0.02 | 9.74 | < 0.5 | 540 | 530 | 0.46 | < 0.1 | 7.56 | 231.0 | 16.1 |
| **FTW - 2** | 1/16/01 | ND | **1100** | **1200** | **3100** | ND | ND | ND | 1350 | **300/520*** | ND/150* | ND/89* | < 0.02 | 8.80 | < 0.5 | 390 | 470 | 0.51 | < 0.5 | 7.58 | 89.7 | 15.5 |
| **FTW - 3** | 1/16/01 | ND | **2600** | **1100** | **4000** | ND | ND | ND | 1390 | **260** | ND | ND | < 0.02 | 2.97 | < 0.5 | **740** | 600 | 0.49 | < 0.1 | 7.51 | 254.0 | 16.4 |
| **FTW - 4** | 1/16/01 | ND | ND | ND | ND | 20 | ND | ND | ND | ND | ND | ND | < 0.02 | 3.42 | < 0.5 | 570 | 560 | 0.69 | < 0.1 | 7.49 | 231.0 | 15.5 |
| **W-23** | 1/16/01 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ** | ** | ** | ** | ** | 0.80 | ** | 7.98 | 40.8 | 10.3 |
| **Trip Blank** | 1/16/01 | < 1.0 | < 1.0 | < 1.0 | < 2.0 | < 1.0 | < 1.0 | < 1.0 | < 2.0 | < 1.0 | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** | ** |

ND - Lab Reported Non-Detect
* - 8260/8310 Methodology
** - not sampled or tested

Data checked _____ / _____

# APPENDIX A

## Borehole Lithologic Logs

# APPENDIX B

## Laboratory Analytical Reports

# APPENDIX C

## Health and Safety Plan

# APPENDIX D

## Hydrocarbon Spill Mass Estimates